S/019/0065
cc: Tom
Task: 4190

Energy Fuels Resources

June 10, 2011

Mr. Robert Duraski
U.S. Environmental Protection Agency
1595 Wynkoop Street
Denver, CO 80202-1129

Transmittal: Proposed Meteorological Tower Location and Meteorological Monitoring Quality Assurance Project Plan, Whirlwind Mine, Mesa County, Colorado

Dear Bob,

Energy Fuels requests formal EPA approval of the meteorological tower location for the Whirlwind Mine. Please see Figure 1 showing the proposed tower location. The meteorological tower will be installed for the purpose of collecting site-specific wind speed and direction data to be used in modeling radon dose estimates to the nearest public receptor of the Whirlwind Mine in accordance with 40 CFR Part 61, Subpart B. As indicated in Energy Fuels Application for Approval of Construction, revised March 2011, we anticipate using an RM Young AQ Wind Monitor (model 05305) or equivalent. Consistent with our application, the tower will be 10 meters high and will be installed at a location with wind conditions representative of Beaver Mesa and at least 100 meters from vents shafts to minimize influences from the shaft(s).

The proposed met tower location is on a Utah State Section, managed by the Utah School and Institutional Trust Lands Administration (SITLA), and centrally located among the proposed vent shafts (see Figure 1). The location is at an approximate elevation of 7,460 feet amsl, which is relatively near the elevations of the proposed vent shafts, ranging from 7,400 to 7,640 feet amsl, and the nearest public receptor, at approximately 7,400 feet amsl.

As shown on Figure 2, the proposed met tower location is in a clearing which is large for the area. Attached photographs show a 360 degree panoramic view of the clearing. Note that the photographs were taken from a location approximately 70 feet northeast of the proposed met tower location. The location is approximately 120 feet south of an existing dirt road and the northern boundary of the Utah State Section. The closest tree to the proposed location is approximately 11 feet high and 60 feet east of the proposed met tower location. Other trees include a stand of 10 to 12-feet high trees approximately 65 feet to the southwest and a 75 feet high tree approximately 400 feet north of the met tower location. The location in this clearing was selected to optimize its distance from nearby obstructions (i.e., trees) relative to their height (see Figure 3). The distance from the proposed met tower location to nearby trees is a minimum of five times the respective tree height. Alternatively, the 11-foot tree in the clearing could be removed. This would

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result in an optimum location that is approximately six tree heights from nearby trees and 170 feet south of the dirt road (see Figure 4)

A Quality Assurance Project Plan (QAPP) for the met tower is attached. The QAPP includes procedures to perform calibrations and audits of the wind monitor and site checks of the equipment. Calibration and audits will each be performed on a semi-annual basis. Site checks will be performed regularly when the site is accessible and will include verification that the wind monitor is operating appropriately and that it is not damaged.

Following EPA's approval of the met tower location, Energy Fuels will submit an addendum to our Utah Division of Oil, Gas and Mining (DOGM) Small Mine Permit to add the met tower to the permit. Approval of the addendum and submission of a reclamation bond will be required by DOGM prior to installation of the met tower.

Please contact me or Frank Filas, Environmental Director, should you have any questions or need additional information.

Sincerely,

Zach Rogers, P.E.
Environmental Engineer

Attachment

Cc: F. Filas, Energy Fuels
Tom Munson, Utah DOGM
Jay Morris, Utah DAQ
Will Stokes, Utah SITLA
Rebecca Doolittle, Moab Bureau of Land Management
Russ Means, Colorado Division of Reclamation, Mining and Safety

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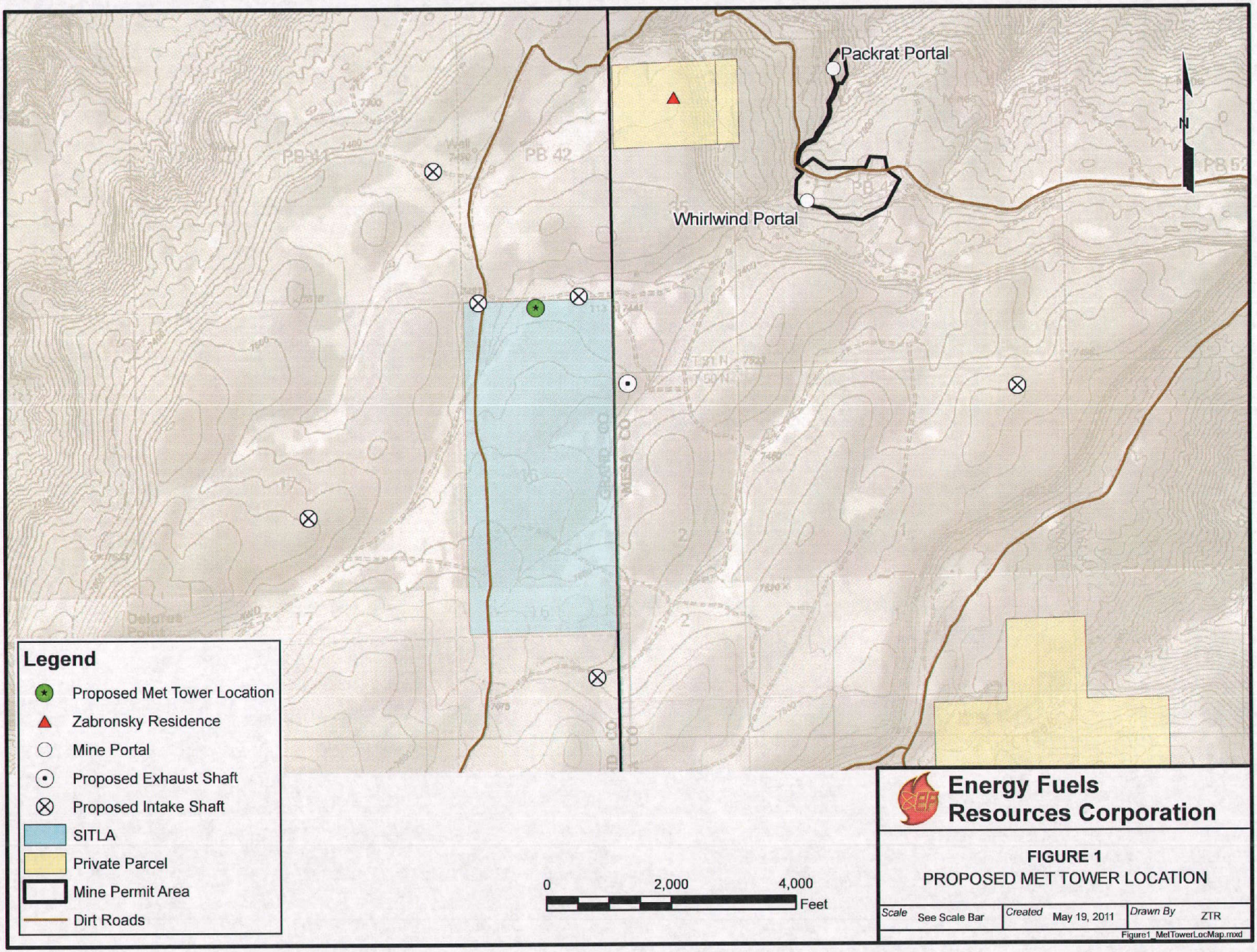
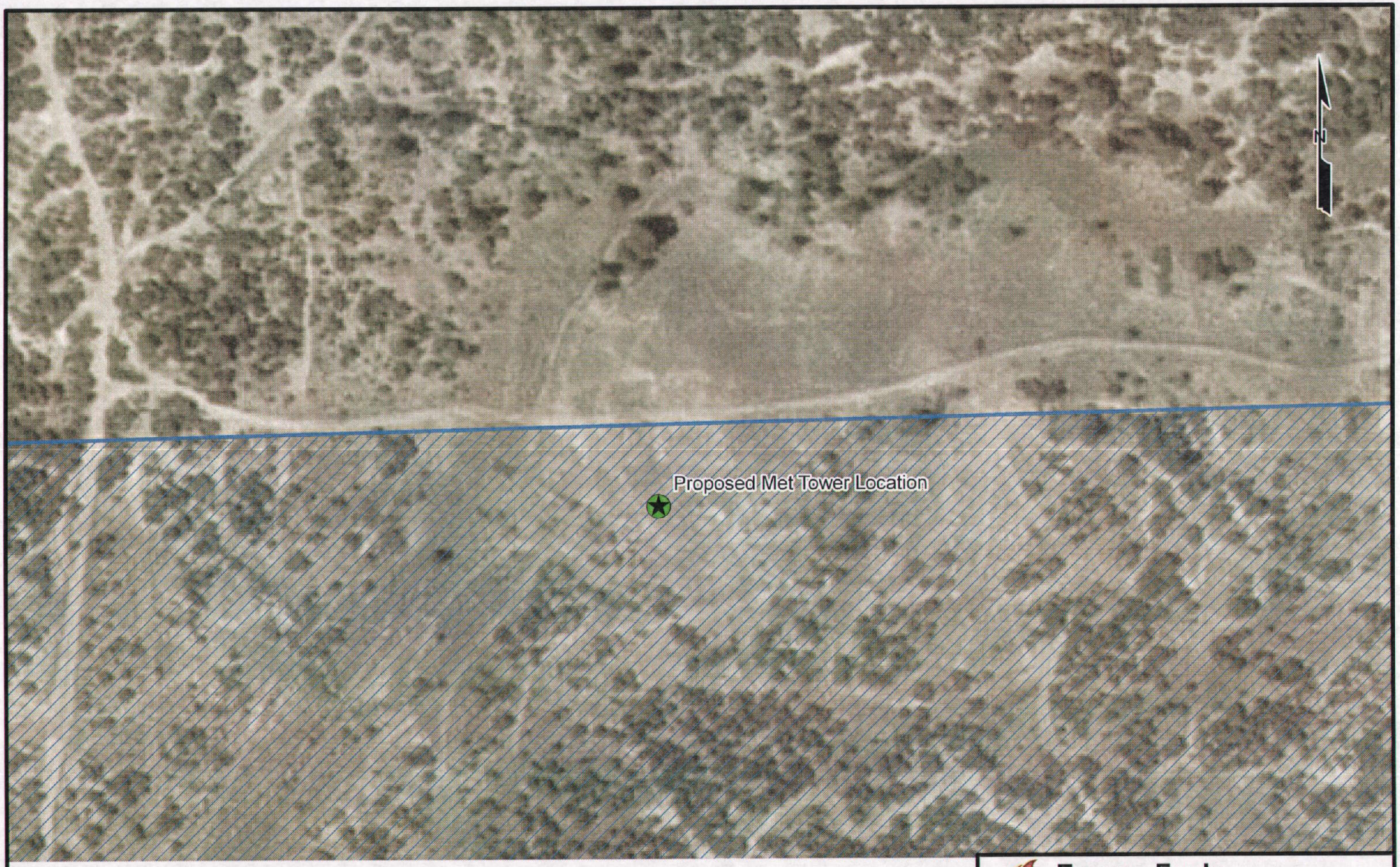

Packrat Portal
Whirlwind Portal
N
Legend
Proposed Met Tower Location
Zabronsky Residence
Mine Portal
Proposed Exhaust Shaft
Proposed Intake Shaft
SITLA
Private Parcel
Mine Permit Area
Dirt Roads
0
2,000
4,000
Feet
Energy Fuels Resources Corporation
FIGURE 1
PROPOSED MET TOWER LOCATION
Scale See Scale Bar
Created May 19, 2011
Drawn By ZTR
Figure1_MetTowerLocMap.mxd



Legend

Utah State Section

0 200 400 Feet

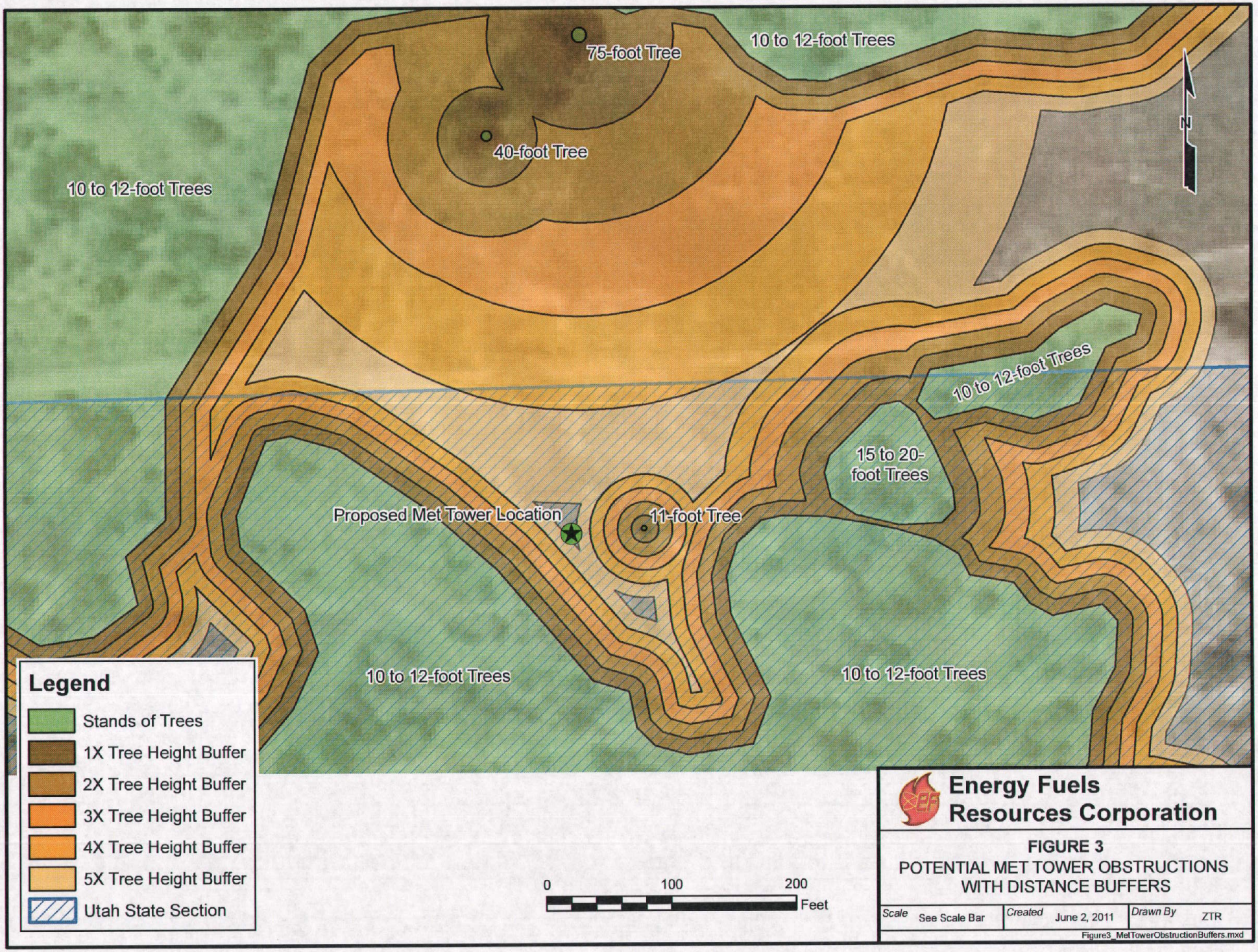
Energy Fuels Resources Corporation

FIGURE 2

MET TOWER AREA

Scale	See Scale Bar	Created	June 1, 2011	Drawn By	ZTR

Figure2_MetTowerArea.mxd



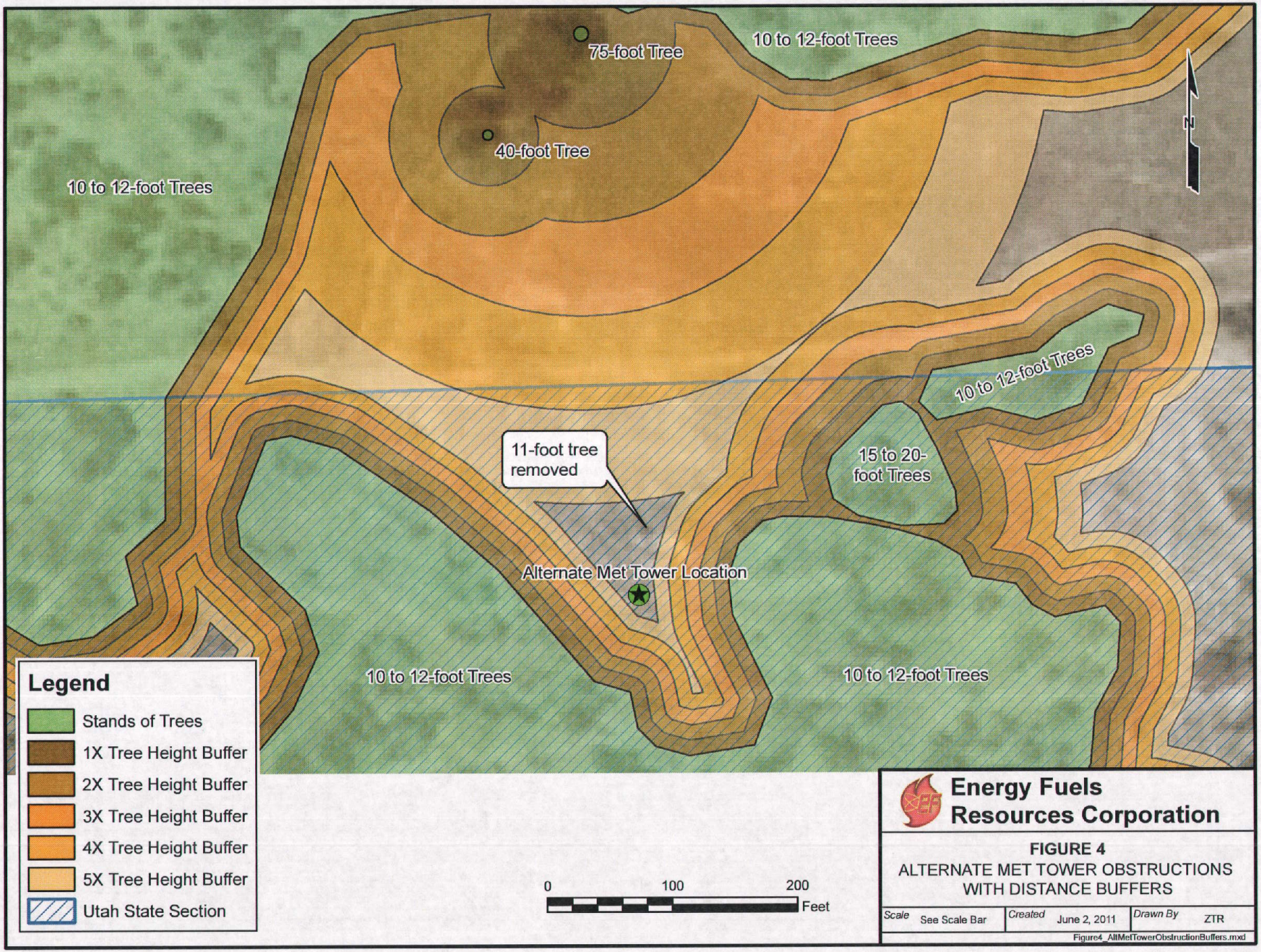
Energy Fuels Resources Corporation

FIGURE 3

POTENTIAL MET TOWER OBSTRUCTIONS WITH DISTANCE BUFFERS

Scale	Created	Drawn By
See Scale Bar	June 2, 2011	ZTR

Figure3_MetTowerObstructionBuffers.mxd



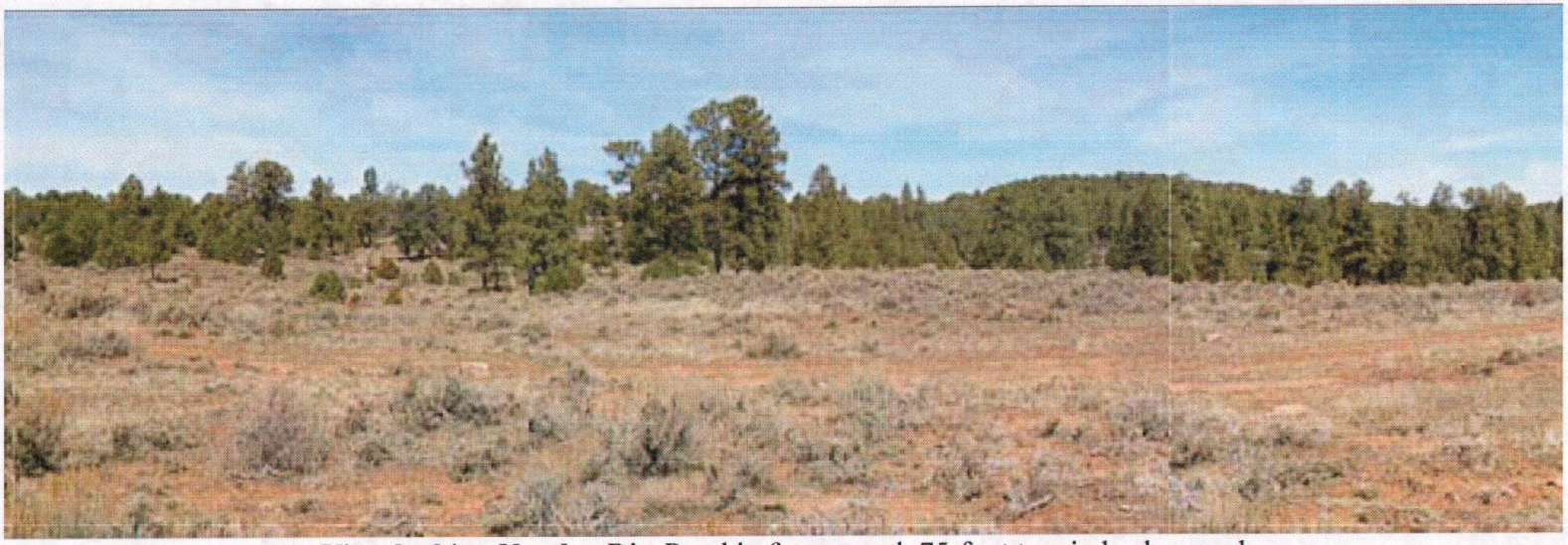
Energy Fuels Resources Corporation

FIGURE 4

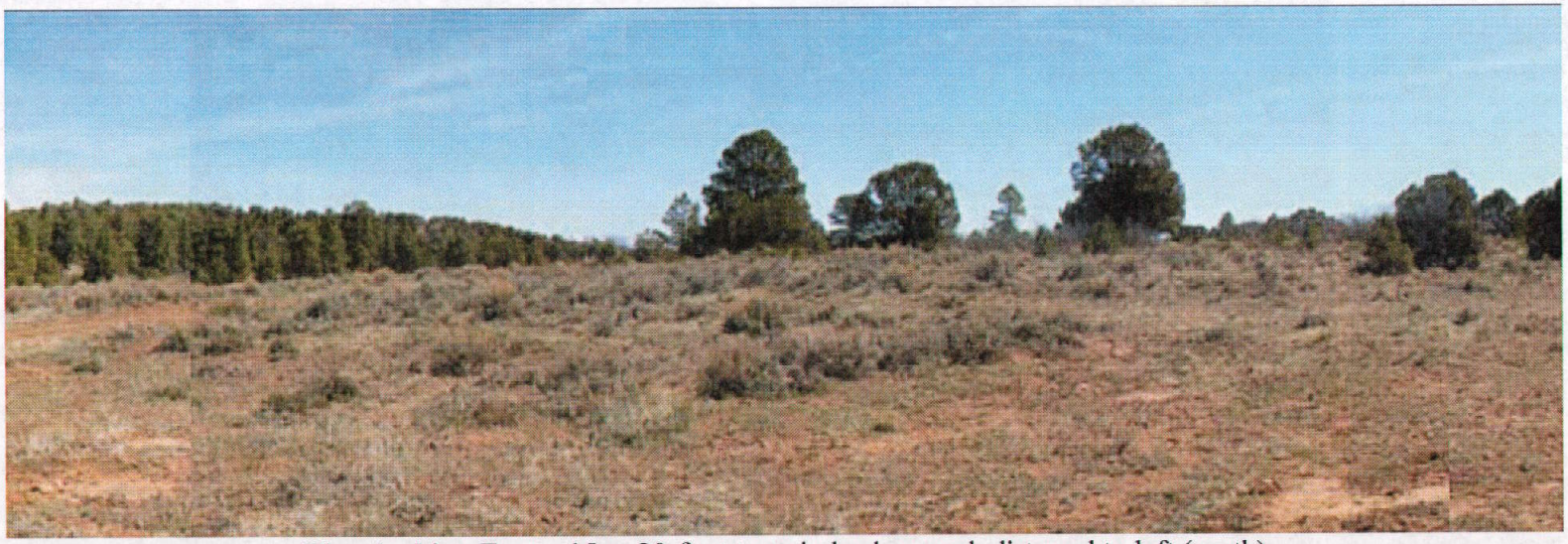
ALTERNATE MET TOWER OBSTRUCTIONS WITH DISTANCE BUFFERS

Scale	Created	Drawn By
See Scale Bar	June 2, 2011	ZTR

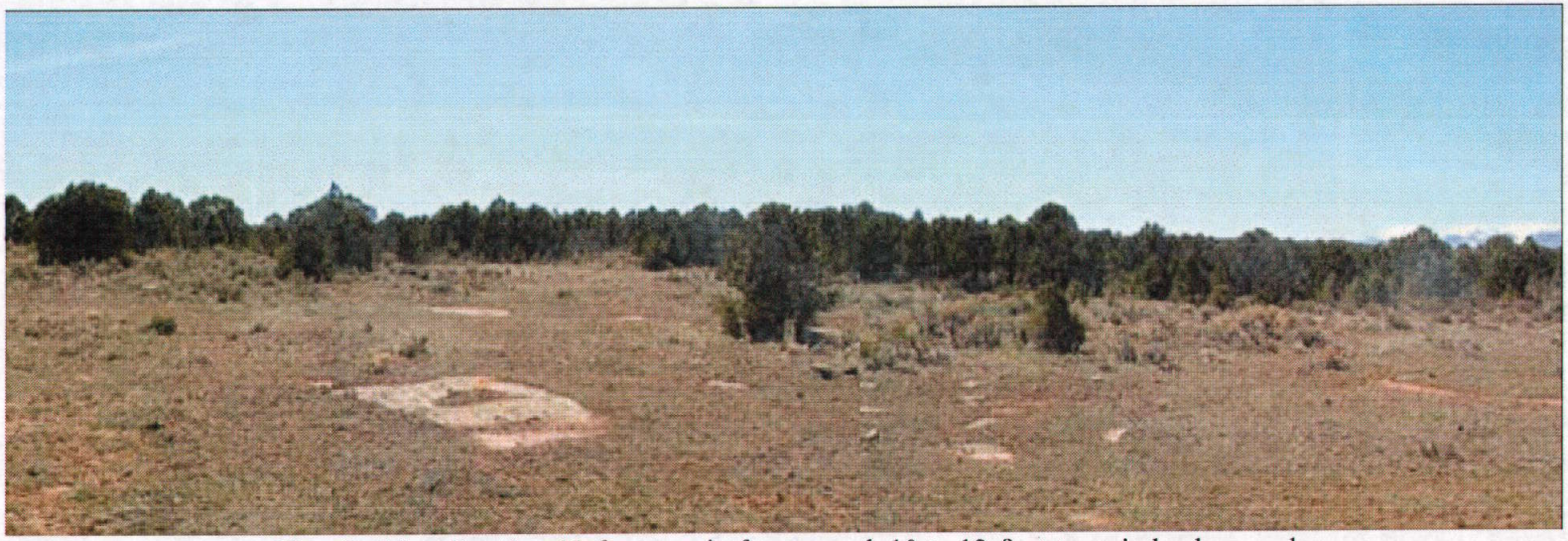
Figure4_AltMetTowerObstructionBuffers.mxd



View looking North – Dirt Road in foreground, 75-foot tree in background



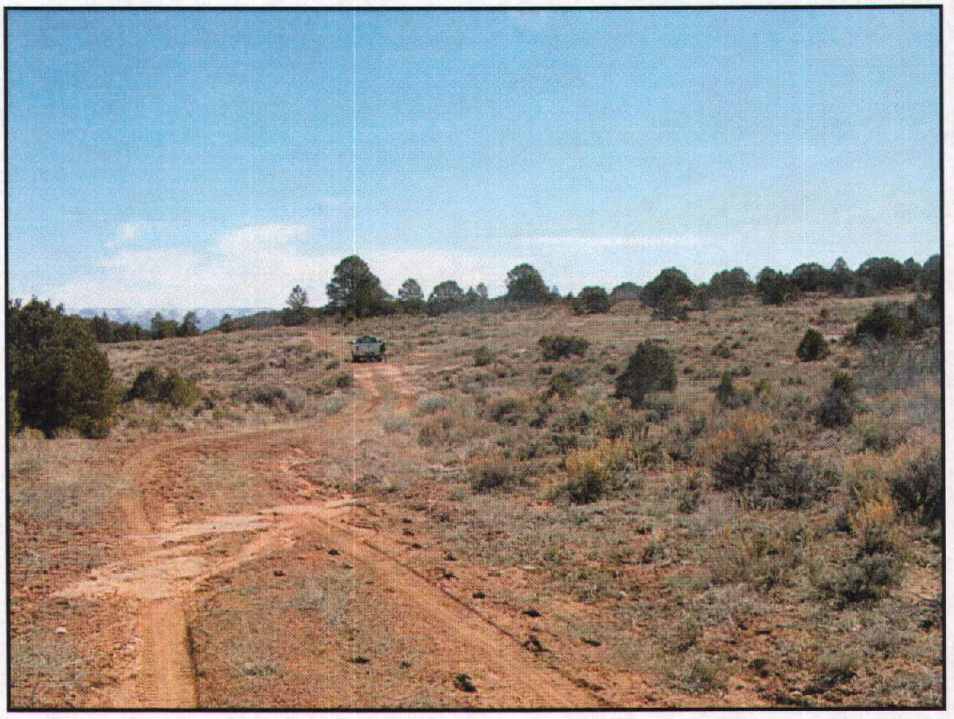
View looking East – 15 to 20-foot trees in background, dirt road to left (north)



View looking South – 11-foot tree in foreground, 10 to 12-foot trees in background

View looking West – 10 to 12-foot trees in background, dirt road to right (north)

METEOROLOGICAL MONITORING QUALITY ASSURANCE PROJECT PLAN WHIRLWIND MINE, MESA COUNTY, COLORADO



Prepared for:
Region VIII U.S. Environmental Protection Agency
1595 Wynkoop Street
Denver, CO 80202-1129

Prepared by:
Energy Fuels Resources Corporation
44 Union Boulevard, Suite 600
Lakewood, CO 80228

June 2011

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1.0 QUALITY ASSURANCE OBJECTIVES

The objective of the Quality Assurance Project Plan (QAPP) is to establish a Quality Assurance Program that assures that the meteorological data produced is both defensible and valid. This is achieved through the use of quality control procedures and independent audit procedures. Quality control procedures are primarily internal procedures, although they may be performed by a contractor to Energy Fuels, as necessary. These procedures include procurement of appropriate equipment, proper installation of the equipment, regularly scheduled calibrations of the equipment, regularly scheduled preventative maintenance of the equipment, proper data validation of data and reporting of data. Independent audit procedures include regularly scheduled quality assurance audits of the equipment to be performed by an independent party (i.e., a 3rd-party contractor).

2.0 PROJECT DESCRIPTION

The Whirlwind Mine is an underground uranium/vanadium mine located approximately 5 miles southwest of Gateway, Colorado in Mesa County with an address of 30100 5/10 Road, Gateway, Colorado 81522. The Whirlwind property, which straddles the Colorado/Utah state line, consists of 206 unpatented claims and a State of Utah mineral lease in the Beaver Mesa Mining District of the Uravan Mineral Belt (see Figure 1). In Mesa County, Colorado, the claims lie in: Section 31, T51N, R19W; Section 6, T50N, R19W; Sections 25, 26, 35, and 36 of T51N, R20W; and Sections 1, 2, 11 and 12 of T50N, R20W, New Mexico Principal Meridian (NMPM). In Grand County, Utah, the property is located in Sections 4, 5, 7, 8, 9, 16, 17, 18, 19, 20, and 21 of T25S, R26E, Salt Lake Based Meridian (SLBM). The claim block encompasses approximately 5,000 acres. The approximate centroid of the claim block lays at 38° 38' North, 109° 04' West. The unpatented claims are on public land administered by the U.S. Bureau of Land Management (BLM). The mineral rights are controlled by Energy Fuels through long-term lease agreements with the claim owners and a State of Utah mineral lease for the 320 acres in Section 16.

The proposed surface disturbance associated with the Whirlwind Mine is concentrated on the Colorado side of the state line with only vent shafts and associated access roads located in Utah. The Whirlwind and Packrat portals are located within the middle tributary to Lumsden Canyon, which runs from the southeast to the northwest with high elevation relief on either side. The proposed vent shafts surface on Beaver Mesa and are located to the west and southwest of, and approximately 500 feet higher than the portals.

Title 40, Part 61, Subpart B of the Code of Federal Regulations (CFR) requires that underground uranium mines limit radon-222 emissions to any member of the public to an effective dose of 10 millirem per year (mrem/yr) or less. The regulation requires that the EPA's COMPLY-R code (or some other model with prior EPA approval) be used to calculate the dose to the nearest pubic receptor.

Energy Fuels plans to use the COMPLY-R code to estimate the radon-222 dose to the nearest receptor based on inputs provided by the user. The inputs that are required for the program include:

- Mean Wind Speed, Direction and Frequency
- Radon-222 Emissions for Each Exhaust Point
- Release Height for Each Exhaust Point
- Vent Diameter for Each Exhaust Point
- Distance from Each Exhaust Point to the Nearest Receptor(s)
- Mean Volumetric Flow Rate for Each Exhaust Point
- Mean Vent Temperature for Each Exhaust Point
- Mean Air Temperature

The mean wind speed, direction and frequency are based on site-specific measurements made at a meteorological tower (met tower). This QAPP describes the Quality Assurance Program that is implemented to insure that data collected from the met tower and associated equipment is representative of actual wind conditions.

3.0 PROJECT ORGANIZATION

The overall project organization is shown schematically in the Project Organization Chart below. Project staff and their respective roles are detailed in Table 1.

Program administration, management, and quality assurance is performed by Energy Fuels Resources personnel. The Monitoring Team Leader will provide onsite oversight and will assist the field team with technical, operational, or other project-related issues. Meteorological equipment audits are performed by Inter-Mountain Laboratories (IML).

Project Organization Chart

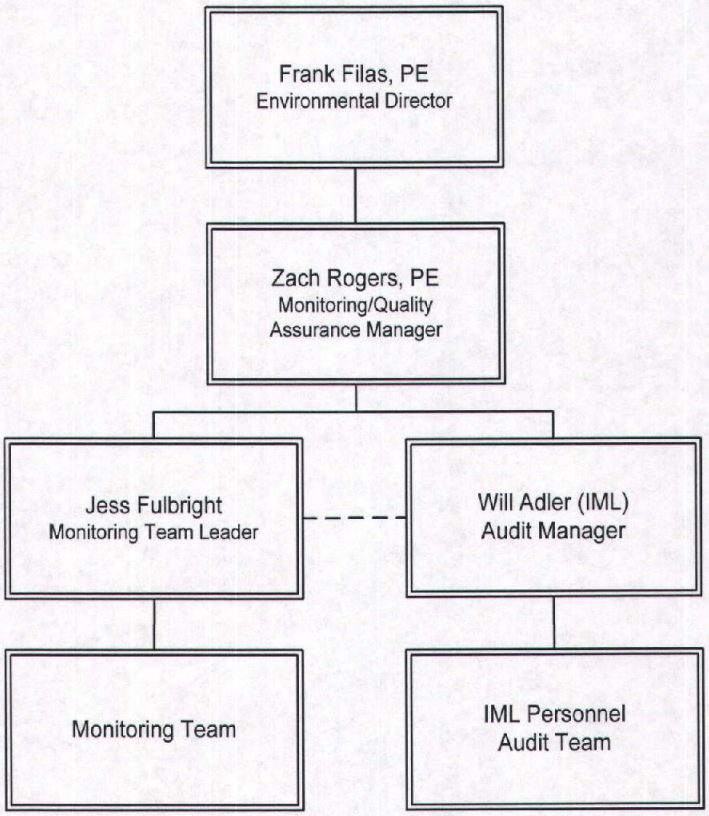


Table 1
Roles and Responsibilities

Name	Project Role	Responsibilities	Experience
Frank Filas, PE	Environmental Director	Program Management	Engineering, Licensing, Operations Management
Zach Rogers, PE	Monitoring/Quality Assurance Manager	Project Management, Quality Assurance, Report Preparation	Project Management, Field Operations, Air Quality, Quality Control, Meteorology
Jess Fulbright	Monitoring Team Leader/ Health & Safety Officer	Field Operations Management, Sampling, Health & Safety Compliance	Field Operations, Health & Safety Compliance
EFR Personnel	Monitoring Team	Data Collection, Equipment Calibration, Maintenance	Field Operations
Will Adler (IML)	Audit Team Project Manager/Technical Support	Project Management, Field Work/Audit	Project Management, Meteorology, Air Quality, Ambient Air Quality Modeling
IML Personnel	Audit Team	Field Calibrations and Audits	Meteorology, Air Quality, Ambient Air Quality Modeling

4.0 QUALITY CONTROL PROCEDURES

Quality Control procedures are performed by Energy Fuels staff and/or Energy Fuels contractors. These procures include procurement of appropriate equipment, proper installation of the equipment, regularly scheduled calibrations of the equipment, regularly scheduled preventative maintenance of the equipment, proper data validation and reporting. Standard Operating Procedures (SOPs) for operating and maintaining the met tower and equipment are provided in Appendix A.

4.1 Equipment Procurement

The anemometer mounted on the met tower is an RM Young AQ Wind Monitor (Model 05305) and is mounted approximately 10 meters from ground level and is capable of measuring both wind speed and direction. The data logger is an Onset HOBO Micro Station data Logger, Model no. H21-002. These equipment meet the EPA Meteorological Monitoring Guidance for Regulatory Modeling Applications (MMGRMA, EPA 2000) performance specification recommendations. The specifications for these equipment are summarized in Table 2 in comparison with MMGRMA performance specification recommendations.

Table 2
Wind Monitor Performance Specifications

	Wind Monitor AQ	MMGRMA
Wind Speed		
Range	0 to 50 m/s	N/A
Accuracy	± 0.2 m/s or 1% of reading	± (0.2 m/s + 5% of observed)
Threshold Speed	0.4 m/s	≤ 0.5 m/s
Distance Constant	2.1 m	≤ 5 m
Wind Direction		
Range	0 to 360°	N/A
Accuracy	± 3°	± 5°
Threshold Speed	0.5 m/s @ 10°	≤ 0.5 m/s @ 10°
Damping Ratio	0.45	0.4 to 0.7
Delay Distance	1.2 m	≤ 5 m

4.2 Installation

The met tower is installed on Beaver Mesa in the vicinity of the ventilation shafts and the nearest public receptor (see Figure 1). The met tower is installed at a location with wind conditions representative of Beaver Mesa and at least 100 meters from any vent shaft to minimize influences from the shaft(s). Manufacturer's procedures for unpacking, inspecting, installing, and performing system diagnostics were followed to assure that all components are functioning appropriately.

4.3 Calibrations

Meteorological equipment is calibrated following installation and prior to producing valid data as a method of acceptance testing. This insures that the equipment has not been damaged or fallen out of calibration specifications during shipment and installation. Following the acceptance testing calibration, calibrations are conducted on six-month intervals during mine operations. The SOP for calibration of the anemometer is provided in Appendix B. If equipment fails one or more calibration tests, corrective actions to remedy the cause of the failure(s) are performed as soon as practical. Typically, corrective actions involve replacement of a system component. Spare parts for system components that are subject to wear (e.g., bearings) or likely damage (e.g., props) are kept on-site. A follow-up calibration audit is performed following maintenance of equipment.

4.4 Preventative Maintenance

Preventative maintenance of the meteorological equipment is achieved through site checks of the equipment and replacement of worn components.

Site checks of the met tower and anemometer are conducted on a weekly basis while the equipment is collecting data for purposes of modeling (i.e. while the mine ventilation system is in continuous operation). Site checks include visual inspection of the tower, anemometer and data logger for proper operation. During each site check, the site check form (see Appendix A) will be filled out to document the condition of the equipment. Any damaged or out-of-specification equipment will be replaced as soon as practical.

Worn components on the equipment are identified through analysis of the data or during routinely scheduled system calibrations and audits. As components, especially bearings, begin to show characteristics of wear by approaching the system performance specification limits, the components will be replaced. System calibrations and audits are staggered so that these types of checks are made on a quarterly basis.

4.5 Data Validation and Reporting

Data is validated to Level 1 Validation as defined by MMGRMA (EPA 2000). Further data validation is not practical at this site due to its remote nature and the absence of nearby and comparable meteorological data. Level 1 data validation is consistent with the EPA Air Quality System (AQS) and includes screening and manual review of the data values. Invalid data is flagged with standard AQS qualifiers. Data is validated on a

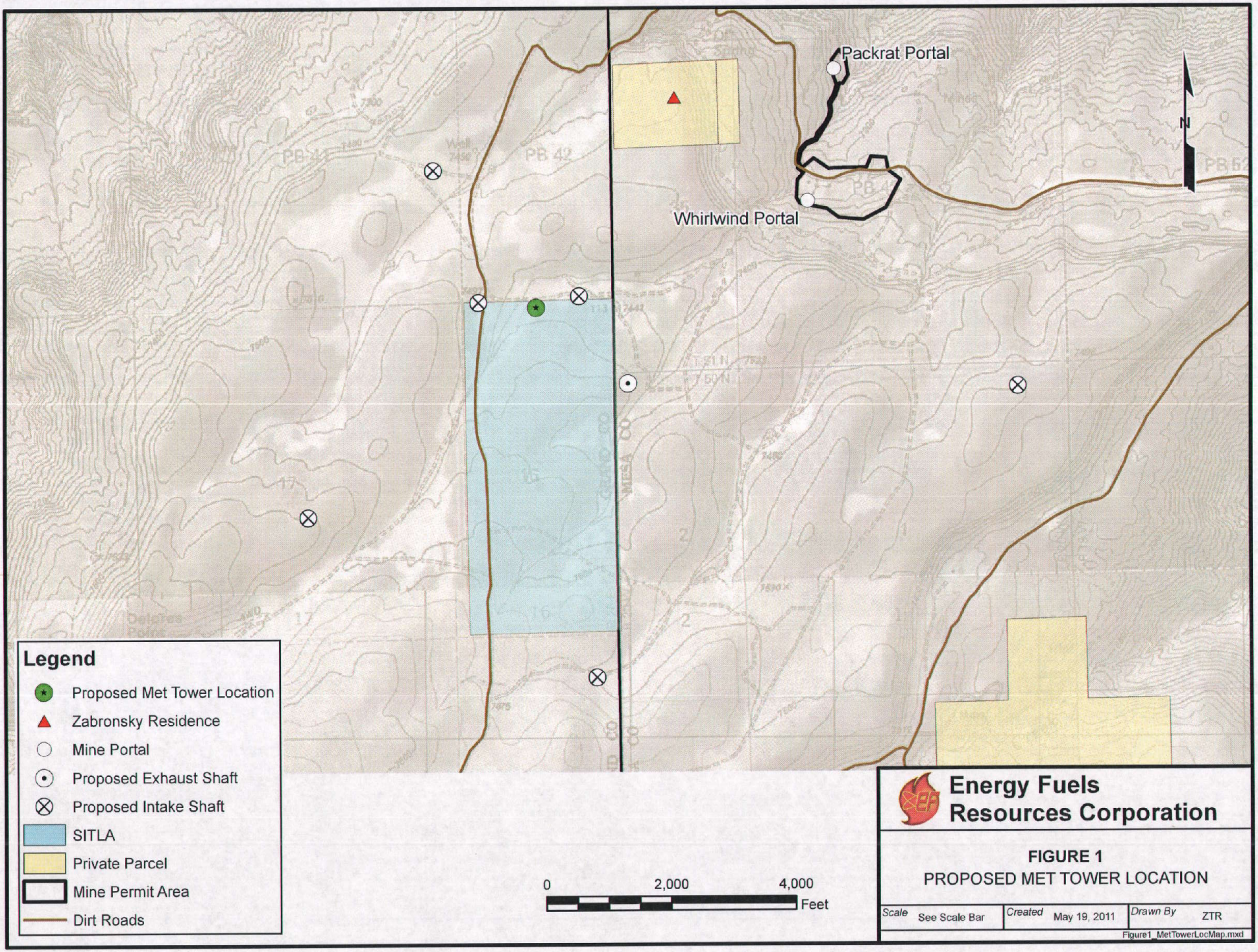
quarterly basis and compiled in a quarterly report. Data reports are available for review by EPA upon request.

5.0 INDEPENDENT AUDIT PROCEDURES

Independent audits of the equipment are provided by an independent contractor and are similar in nature to system calibrations. The specific standard operating procedure for performing independent audits is determined by the contractor and is consistent with MMGRMA (EPA 2000) and current industry practices. Audit performance limits are identical to the calibration performance limits (Appendix B). Failed audits are reported immediately to Energy Fuels' personnel and corrective actions to remedy the cause of the failure are performed as soon as practical. Typically the corrective actions involve replacement of a system component. Spare parts for system components that are subject to wear (e.g., bearings) or likely damage (e.g., props) kept on-site. Following maintenance of equipment a follow-up calibration or audit is performed.

6.0 REFERENCES

EPA 2000. *Meteorological Monitoring Guidance for Regulatory Modeling Applications*. February.


Packrat Portal
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Private Parcel
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4,000
Feet
Energy Fuels Resources Corporation
FIGURE 1
PROPOSED MET TOWER LOCATION
Scale See Scale Bar
Created May 19, 2011
Drawn By ZTR
Figure1_MetTowerLocMap.mxd

APPENDIX A
Meteorological Equipment SOP

METEOROLOGICAL TOWER
STANDARD OPERATING PROCEDURE

1.0 METEOROLOGICAL INSTRUMENT INSTALLATION

Meteorological instruments will be assembled, installed and prepared for operation according to the procedure in the manufacturer's operating manuals. Calibration of the instruments will be performed following installation.

2.0 WIND SPEED/WIND DIRECTION MONITOR

Wind speed and wind direction will be measured using the R.M. Young Model 05305 Wind Monitor AQ.

2.1 Operation

The wind monitor will be operated continuously when the mine ventilation system is in continuous operation, except during temporary shutdowns for calibrations, audits, and maintenance.

2.2 Maintenance and Calibration

The calibration of the wind monitors will be checked semi-annually and on an as-needed basis by qualified personnel. If calibration is needed, the sensor will be removed and shipped to the manufacturer for recalibration. The removed sensor will be replaced as soon as practical. The wind monitors will be visually inspected weekly for proper motion.

3.0 WEEKLY INSTRUMENT CHECKS

Note time and date of weekly check and technician name in Site Notebook.

3.1 Necessary Equipment

Site Notebook
Writing Instrument

3.2 Weekly Instrument Check Procedure

1) Check movement of wind vane.
2) Check movement of wind speed propellers.
3) Check that data logger is on and recording.
4) Record information above in Site Notebook.

4.0 MONTHLY INSTRUMENT CHECKS

Note time and date of monthly check and technician name in Site Notebook.

4.1 Necessary Equipment

Site Notebook

Writing Instrument

Computer (or appropriate device) with for data retrieval software

4.2 Monthly Instrument Check Procedure

1) Perform Weekly Instrument Checks.
2) Download data from data logger according to manufacturer's instructions.

5.0 CALIBRATION PROCEDURES

The meteorological sensors will be calibrated semi-annually and on an as-needed basis by qualified personnel.

6.0 AUDIT PROCEDURES

Independent auditing will be performed on a semi-annual basis and independent contractor. Audits will be performed in accordance with the contractor's standard operating procedures.

7.0 DATA COLLECTION

Meteorological data will be retrieved on a monthly basis via direct download from the data logger. Retrieved records will be loaded into database format through the use of appropriate software and tabulated into data files for validation and reporting.

APPENDIX B

Wind Monitor Calibration SOP

CALIBRATION PROCEDURES
WIND SPEED/DIRECTION

The procedures outlined below are for an R.M. Young Model 05305 Wind Monitor AQ.

1. Record the appropriate site, date, sensor and calibration device models and serial numbers on the calibration spreadsheet.

2. Prior to lowering the tower, use a magnetic compass, corrected for the local magnetic declination, to determine the orientation of either a sensor alignment rod or a cross arm used to support the sensor.

3. Record this value on the spreadsheet under "X-Arm Alignment – As Found".

4. Carefully lower the tower and rest the top of the tower on a support to allow the sensor to rotate freely without interference from the ground or other obstructions.

5. Record the time that the data becomes invalid due to the calibration.

WIND DIRECTION

Sensor Alignment

6. With the sensor on the tower, align the senor parallel to the X-arm and record the data acquisition system (DAS) value under "Sensor Alignment – As Found" on the spreadsheet.

Bearing Check

7. Remove the sensor from the tower. ENSURE that the "Sensor Orientation Ring" remains on the tower. If there is no "Ring", it will be necessary to mark the tower and sensor base to allow for the proper reinstallation of the sensor.

8. Install the sensor on the Vane Angle Bench Stand without the alignment arm assembly.

9. Install the Vane Torque Gauge on to the sensor body with the gauge leaf spring pointed toward the front of the sensor and the "Bearing Centerline" over the vane bearing.

10. Ensure the Bench Stand is located on a flat surface and no air flow is present.

11. Attach a thread to the end of the torque leaf and apply a steady force perpendicular to the sensor.

12. Observe the amount of torque required to move the vane and to maintain its movement. This should be less than 11.0 gram-centimeters (gm-cm). This check should be performed at least at the four cardinal points. Record the approximate torque required to rotate the vane.

Sensor Continuity Check

13. With the sensor on the Bench Stand (with alignment arm assembly) rotate the sensor to directions around the compass in 30 degree increments. It is advisable to avoid the compass points 355 to 0° since this is a "dead spot" resulting from the deadband region of the potentiometer.

14. Record the DAS values at each compass point.

WIND SPEED

15. Remove the propeller from its shaft.

16. Record the model and serial number of the propeller.

Bearing Check

17. With the sensor on the Bench Stand attach the anemometer torque disk to the propeller shaft.

18. Install a 1.0 gram weight (a silver screw) in the threaded hole adjacent to the propeller shaft.

19. With the threaded holes aligned horizontally, the disk should rotate downward when released. Check the bearing for both the clockwise and counter-clockwise rotation.

Sensor Output Check

20. Attach the calibration device clamp and bar assembly to the sensor housing.

21. Attach the calibration motor to the bar assembly and slide the motor along the bar until the motor shaft coupling can be slid on to the sensor propeller shaft.

22. Ensure the motor and propeller shafts are aligned.

23. Gently tighten the clamp assembly.

24. Set the "Direction Switch" on the anemometer control unit to "CW".

25. Record the DAS value on the spreadsheet with no shaft rotation (0.0mps).

26. Set the control unit to an RPM of 2 (i.e.,200 RPM).

27. Turn the control unit "ON".

28. Ensure there is no binding of the shaft adapter.

29. Allow the unit to operate until a stable DAS reading is obtained. At the low speeds, the DAS value may not be stable beyond 1 decimal place.

30. Record the control unit display (actual input) and the DAS value (to the nearest 0.1) on the spreadsheet.

31. Repeat steps 26-30 for RPM values of 400, 800, 1200, 2400 and 4000 and record the corresponding control unit and DAS values.

32. Calculate the wind speed in meters per second (mps) and the differences between the inputted rpm (speed) and the DAS value.

33. Remove the calibration device.

34. Replace the sensor on the tower.

35. Carefully raise the tower if all parameters on the tower have been calibrated.

36. Record the time that the data becomes valid following the calibration.

Calibration Spreadsheet – Wind Direction

Location: _____
Date: _____
Technician: _____

Sensor
Man/Model: RM Young 05305
Serial No: _____
Range: 0 – 360 degrees

Data Acquisition System
Man/Model: _____
Serial No: _____

Vane Condition: _____

Bearing Condition: _____ (<11.0 gm-cm)

Sensor Alignment Check

	X-Arm Alignment (degrees)	Sensor Alignment (degrees)	Difference (degrees)
As Found			
As Left			

Continuity Check

Input Compass Point (degrees)	Data Acquisition (degrees)	Difference (degrees)
5		
30		
60		
90		
120		
150		
180		
210		
240		
270		
300		
330		
355		

PSD Tolerances
DAS
±5.0 degrees

Calibration Spreadsheet – Wind Speed

Location: _____
Date: _____
Technician: _____

Sensor
Man/Model: RM Young 05305
Serial No: _____
Range: 0 – 50 mps

Propeller
Man/Model: RM Young 05305
Serial No: _____

Data Acquisition System
Man/Model: _____
Serial No: _____

Audit Device
Man/Model: _____
Serial No: _____

Propeller Condition: _____
Bearing Condition: _____ (<1.0 gm-cm)

Input (rpm)	Speed (mps)	Data Acquisition (mps)	Difference (mps)	Difference (percent)
0	0.00			
200	2.29			
400	4.58			
800	9.16			
1200	13.74			
2400	27.49			
4000	45.81			

PSD Tolerances

Speed	DAS
≤5 mps	±0.25 mps
>5 mps	±5.0%